

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for December, 1897, is based on 2,916 reports from stations occupied by regular and voluntary observers, classified as follows: 147 from Weather Bureau stations; numerous special river stations; 32 from post surgeons, received through the Surgeon General, United States Army; 2,567 from voluntary observers; 96 received through the Southern Pacific Railway Company; 23 from Life-Saving stations, received through the Superintendent United States Life-Saving Service; 31 from Canadian stations; 20 from Mexican stations; 7 from Jamaica, W. I. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Government Survey, Honolulu; Dr. Mariano Bárcena, Director of the Central Meteorological Observatory of Mexico; Mr. Maxwell Hall, Government Meteorologist,

Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; and Commander J. E. Craig, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to generally conform to the modern international system of standard meridians, one hour apart, beginning with Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are generally corrected to agree with the eastern standard; otherwise, the local meridian is mentioned.

STORM WARNINGS AND WEATHER FORECASTS.

By Lieut. Col. H. H. C. DUNWOODY, Supervising Forecast Official.

Under this head it is proposed to make note of all extreme and injurious weather conditions occurring during the month, and the warnings of the same issued by the Bureau, with instances, as far as reported by observers or the press, in which these warnings were of special public benefit. The signals displayed by the Weather Bureau will be referred to as "information," "storm," "hurricane," "cold wave," and "norther," respectively.

The following notes have been collected.

No very severe or destructive storms occurred during the month.

The injurious weather conditions of most marked note were the frosts and freezing weather that occurred in the citrus fruit districts of California on the 2d and 3d and from the 16th to the 22d, inclusive. On the former dates the temperature fell to considerably below freezing as far south as Los Angeles and Riverside counties, but the injury to the fruit interests was probably small. Concerning the latter period, Mr. W. H. Hammon, forecast official, in charge of the Weather Bureau office at San Francisco, reports:

Beginning with Wednesday night, December 15, and continuing until December 22, inclusive, temperatures at least approximating and in some places falling below the danger point were experienced in the citrus regions of California. On the nights of December 15, 16, and 17 probably no injury resulted, although it will be observed that the Riverside Press on December 17 records a temperature of 26° and states that extensive efforts at protection were employed. On Saturday a very slight

depression moved southward across southern California, which had probably been moving from the northeast across Utah and southern Nevada during the two days previous. This caused light showers in southern California, followed by clearing weather and north winds Saturday night. In some sections in the vicinity of Ontario and Pomona the wind ceased, so as to allow serious frost Sunday morning, the temperature falling to 21° and 24° in low places. The most injurious frost was Sunday night, December 19, when the temperature in Redlands, San Bernardino, and Riverside varied in places from 21° to 32°. On the nights of the 20th and 21st almost as severe frost occurred, which probably increased the injury, owing to the continuation of the cold.

From no section has as full and reliable information been received regarding the severity of the frost as from Riverside, and the lowest record that I have been able to find from that section is 22°, and that well down on the side of an arroyo. The temperatures, as a rule, ranged between 24° and 28° in sections in which in December, 1895, they ranged from 20° to 24°. The temperatures recorded at Pomona, San Bernardino, and Redlands this year were as low as those recorded in 1895.

It is difficult to determine the extent of the injury in the citrus region. In northern California the crop was nearly all marketed, and the greater portion of that still on the trees was picked after the warning was received, and consequently the injury was slight. In southern California the Los Angeles Express places the injury between 10 and 20 per cent; the Riverside Press, from 15 to 25 per cent; and the Los Angeles Herald, at one-third of the crop. Probably the estimate of the Riverside Press is the most nearly correct.

Warnings of these frosts were issued by the Weather Bureau in every instance on the morning of the day preceding their occurrence.